

**IN THE UNITED STATES  
PATENT AND TRADEMARK OFFICE**

Appl. No. : 10/574,446  
Applicant(s) : LOEBL et al.  
Filed : April 4, 2006  
TC/A.U. : 2800/2834  
Examiner : J.A. San Martin  
Atty Docket No. : DE 030345  
Confirmation No. : 9662  
Title: BULK ACOUSTIC WAVE SENSOR

**APPEAL BRIEF**

Honorable Assistant Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In connection with the Notice of Appeal dated February 29, 2008, Applicants provides the following Appeal Brief in the above-captioned application.

**TABLE OF CASES**

1. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727; 82 U.S.P.Q.2D 1385 (2007).
2. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966).
3. *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F.2d 406, 412 (CA6 1964).
4. *Ex parte Crawford, et al.* Appeal 20062429, May 30, 2007.

### **1. Real Party in Interest**

The real party in interest as assignee of the entire right and title to the invention described in the present application is Koninklijke Philips Electronics, N.V. Groenewoudseweg 1, Eindhoven, Netherlands 5621 BA.

### **2. Related Appeals and Interferences**

There are no known related appeals or interferences at this time.

### **3. Status of the Claims**

Claim 2-4 are pending in this application. No claims are withdrawn from consideration. Claims 2-4 are the subject of the present Appeal. Claims 2-4 are finally rejected, and are duplicated in the Appendix.

### **4. Status of the Amendments**

A Final Office Action on the merits was mailed on November 29, 2007. An Amendment and/or Response under 37 C.F.R. § 1.116 was filed on January 23, 2008, canceling claim 1 and amending claims 2-4. An Advisory Action was mailed on February 14, 2008, entering the amended claims for purposes of appeal. There are no pending amendments with respect to this application.

### **5. Summary of the Claimed Subject Matter<sup>1</sup>**

In accordance with an embodiment, a sensor includes a substrate (Fig. 2, 1) and multiple individually addressable resonators (Fig. 1, R11-Rmn; Fig. 2, 2-6; paragraphs [0007], [0016]). Each of the resonators (Fig. 1, R11-Rmn; Fig. 2, 2-6; Fig. 2, 2-6) including an acoustic reflector (Fig. 2, 2); first and second resonator electrodes (Fig. 2, 3

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<sup>1</sup> In the description to follow, citations to various reference numerals, drawings, and corresponding text in the specification are provided solely to comply with Patent Office rules. It is emphasized that these reference numerals, drawings, and text are representative in nature, and not in any way limiting of the true scope of the claims. It would therefore be improper to import anything into any of the claims simply on the basis of illustrative language that is provided here only under the obligation to satisfy Patent Office rules for maintaining an Appeal.

and 4); a piezoelectric layer (Fig. 2, 5) separated from the substrate (Fig. 2, 1) by the acoustic reflector (Fig. 2, 2); and a sensing layer (Fig. 2, 6) at least partly covering the first and second resonator electrodes (Fig. 2, 3 and 4), wherein the first and second resonator electrodes (Fig. 2, 3 and 4) are on the same side of the piezoelectric layer (Fig. 2, 5; paragraph [0030]). (Kindly refer to paragraph [0020], [0023] and [0025], as well as claim 3, for further details.)

## 6. Grounds of Rejection to be Reviewed on Appeal

The issue in the present matter is whether:

- I. Claims 2-4 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over *Feucht et al.* (U.S. Patent Application Publication No. 2006/0125489) in view of *Kim* (U.S. Patent No. 6,293,136).

## 7. Argument

In this portion of the Appeal Brief, arguments are provided. Notably, wherever applicable, Applicants maintain previous arguments for patentability provided in responses to Office Actions.

### I. Rejection under 35 U.S.C. § 103(a)

Claims 1-4 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Feucht et al.* (U.S. Patent Application Publication No. 2006/0125489) in view of *Kim et al.* (U.S. Patent No. 6,293,136).

#### A. Legal Standards

Applicants rely at least on the following standards with regard to proper rejections under 35 U.S.C. § 103. As provided in MPEP § 2143, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art cited

must teach or suggest all the claim limitations.

In addition, under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. While the sequence of these questions might be reordered in any particular case, the factors continue to define the inquiry that controls. If a court, or patent examiner, conducts this analysis and concludes the claimed subject matter was obvious, the claim is invalid or unpatentable under § 103. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727; 82 U.S.P.Q.2D 1385 (2007), citing, in part *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966).

However, the Court in *KSR* continued: “A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham*, 383 U.S., at 36, 86 S. Ct. 684, 15 L. Ed. 2d 545 (warning against a “temptation to read into the prior art the teachings of the invention in issue” and instructing courts to “guard against slipping into the use of hindsight” (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F.2d 406, 412 (CA6 1964)). Moreover, if there is no suggestion to combine the teachings of the applied art, other than the use of Applicants’ invention as a template for its own reconstruction, a rejection for obviousness is improper. *Ex parte Crawford, et al.*, Appeal 20062429, May 30, 2007.

## **B. Final Office Action and Advisory Action**

Claim 3 is drawn to a sensor, having a substrate and a plurality of individually addressable resonators, and features:

“...each of the resonators comprising: an acoustic reflector; first and second resonator electrodes; a piezoelectric layer separated from the substrate by the acoustic

*reflector; and a sensing layer at least partly covering the first and second resonator electrodes, wherein the first and second resonator electrodes are on the same side of the piezoelectric layer.”*

In rejecting (original) claims 1 and 3 under 35 U.S.C. § 103(a), the Final Office Action states, in part:

Feucht fails to disclose the resonator comprising an acoustic reflector formed between the piezoelectric layer and a substrate....

Feucht ... fails to disclose the sensor comprising an acoustic reflector, the first, and the second electrode being interdigitated electrode [sic], the sensor comprises a plurality of individually addressable resonator [sic], and the sensing layers of the different resonators comprising different materials.

Final Office Action, pgs. 2-3.

The Examiner clearly acknowledges that *Feucht et al.* does not disclose (a) a sensor comprising a plurality of individually addressable resonators and (b) a resonator (and/or the sensor) comprising an acoustic reflector, and therefore relies on *Kim*, in combination with *Feucht et al.*, to teach the same.

#### **(a) Individually addressable resonators**

With respect to the individually addressable resonators, the Examiner did not identify in the Final Office Action any portion or specific teachings of *Kim*, which is the Examiner's burden. See, e.g., MPEP § 706.02(j) (“[T]he examiner should set forth in the Office action: ... the relevant teaching of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate ....”). The Examiner merely stated that “Kim discloses the idt's, the acoustic reflector, and different coatings.” See Final Office Action, p.3.<sup>2</sup> The Examiner did not say that *Kim* discloses multiple individually addressable resonators, nor where in the *Kim*

<sup>2</sup> The “idt's” apparently are “interdigital transducers,” which the Examiner appeared to equate to first and second electrodes, not multiple addressable resonators.

disclosure multiple individually resonators are discussed.

In addressing this argument in the Advisory Action, the Examiner stated:

Kim discloses a piezoelectric sensor using interdigitated electrodes (idt). As disclosed by Kim, the use of idt's (resonators) individually or independently addressable is old and well known in the art.

Advisory Action, pg. 2. In other words, the Examiner now appears to assert that the "interdigital" electrodes of *Kim*, which does not actually mention "interdigitated" electrodes, teaches resonators as opposed to interdigitated electrodes (e.g., as recited in claim 2).

However, Applicants submit that there are problems with this interpretation. First, if the interdigital electrodes of *Kim* teach resonators, then there is no remaining element of *Kim* corresponding to interdigitated electrodes. Second, the Examiner's unsubstantiated conclusion that an interdigital electrode is the same as an interdigitated transducer (idt), which is the same as a resonator, is incorrect. In fact, *Kim* teaches away from this conclusion. Specifically, *Kim* describes Figs. 2A and 2B (which show interdigital electrodes 117 and/or 117') as SAW sensors having a "resonator configuration," but describes another configuration shown in Fig. 1 (which shows interdigital electrodes 14 and 16) as a surface acoustic wave (SAW) sensor having a "delay line configuration" (i.e., not a resonator configuration). In other words, the mere mention of an interdigital electrode does not render the corresponding sensor a resonator. Third, regardless of whether interdigital electrodes teach resonators, there still is no disclosure in *Kim* of multiple individually addressable resonators.

Accordingly, Applicants respectfully submit that no proper combination of *Feucht et al.* and *Kim* teaches or suggests at least these claim features.

#### **(b) Acoustic reflector**

With respect to a resonator including an acoustic reflector between a piezoelectric layer and a substrate, the Examiner twice in the Final Office Action acknowledged that *Feucht et al.* does not disclose this feature: "Feucht fails to disclose the resonator

comprising an acoustic reflector formed between the piezoelectric layer and a substrate” and “Feucht ... fails to disclose the sensor comprising an acoustic reflector....” The Examiner therefore relied on *Kim*, in combination with *Feucht et al.*, to teach the same. See Final Office Action, pgs. 2-3.

However, the Examiner did not specifically identify any portion of *Kim* that discloses “an acoustic reflector,” making the basis of the rejection unclear, which conflicts with the Examiner’s obligations under MPEP § 706.02(j), as discussed above. Applicants note that the only apparent mention of a reflector in *Kim* is the reflector(s) 122 shown in FIGs. 2A and 2B. However, the reflectors 122 are “[f]ormed on the piezoelectric material 112,” along with the electrodes 117 (and 117’). See FIGs. 2A, 2B; col. 3, lines 30-32 (emphasis added). In contrast, claim 3 recites that the acoustic reflector is between the piezoelectric layer and the substrate, not on the piezoelectric layer (i.e., “a piezoelectric layer separated from the substrate by the acoustic reflector ....”). In fact, such a construction of *Kim* would not be possible because the piezoelectric layer is, in fact, the substrate. See, e.g., col. 3, lines 43-44.

In addressing this argument, the Examiner stated:

As explained in the previous office action, Feucht discloses the structure of the piezoelectric sensor comprising a piezoelectric layer, electrodes and a Bragg reflector located between the piezoelectric and the substrate....

Regarding arguments presented in page 4, second paragraph, it should be noted that Kim was not relied upon to show the reflectors since Feucht discloses such limitation.

Advisory Action, pg. 2.

However, as shown by the above quotes, this was not the basis for rejection as explained in the previous Office Action. Therefore, by now relying on *Feucht et al.* instead of *Kim*, the Final Office Action has asserted “a new ground of rejection” that was not “necessitated by applicant’s amendment of the claims.” See MPEP § 706.07(a). Accordingly, the finality of the Final Office Action was improper, and should be withdrawn. *Id.*

Further, the new ground of rejection does not teach or suggest the claimed feature. In particular, claim 3 recites a piezoelectric layer separated from the substrate by the acoustic reflector. In contrast, the piezoelectric layer (4) shown Fig. 2A and described in paragraph [0069] of *Feutch et al.* appears to be separated from the substrate (3) by an electrode (6), not the Bragg reflector (15).

Accordingly, Applicants respectfully submit that no proper combination of *Feutch et al.* and *Kim* teaches or suggests at least these claim features.

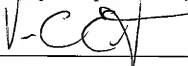
### **C. Rejections Improper**

For at least the reasons set forth above, Applicants respectfully submit that a proper *prima facie* case of obviousness has not been established because the applied art does not disclose at least one feature of each of claim 3. Therefore, claim 3 is patentable over the applied art, and claims 2 and 4, which depend from claim 3, are patentable for at least the same reasons.

## 8. Conclusion

In view of the foregoing, Applicant respectfully requests: the withdrawal of all objections and rejections of record; the allowance of all pending claims; and the holding of the application in condition for allowance.

Respectfully submitted on behalf of:  
is Koninklijke Philips Electronics, N.V.

A handwritten signature in black ink, appearing to read 'V-C Ernest', is written over a horizontal line.

by: Van C. Ernest (Reg. No. 44,099)

Date: April 25, 2008

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**Appendix**

**Claims on Appeal**

2. The sensor of claim 3, wherein the first and the second electrodes are interdigitated electrodes.

3. A sensor comprising a substrate and a plurality of individually addressable resonators, each of the resonators comprising:  
an acoustic reflector;  
first and second resonator electrodes;  
a piezoelectric layer separated from the substrate by the acoustic reflector; and  
a sensing layer at least partly covering the first and second resonator electrodes,  
wherein the first and second resonator electrodes are on the same side of the piezoelectric layer.

4. The sensor of claim 3, wherein the sensing layers corresponding to the plurality of resonators comprise different materials.

**Appendix**

**Evidence (None)**

**Appendix**

**Related Proceedings (None)**